

FIG.1

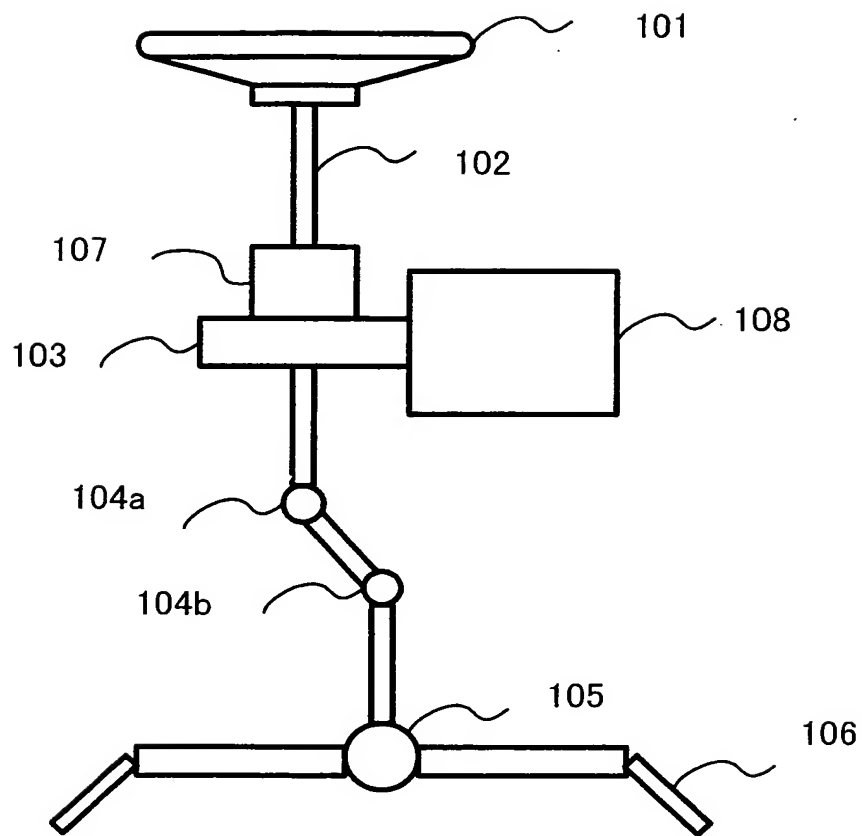


FIG.2

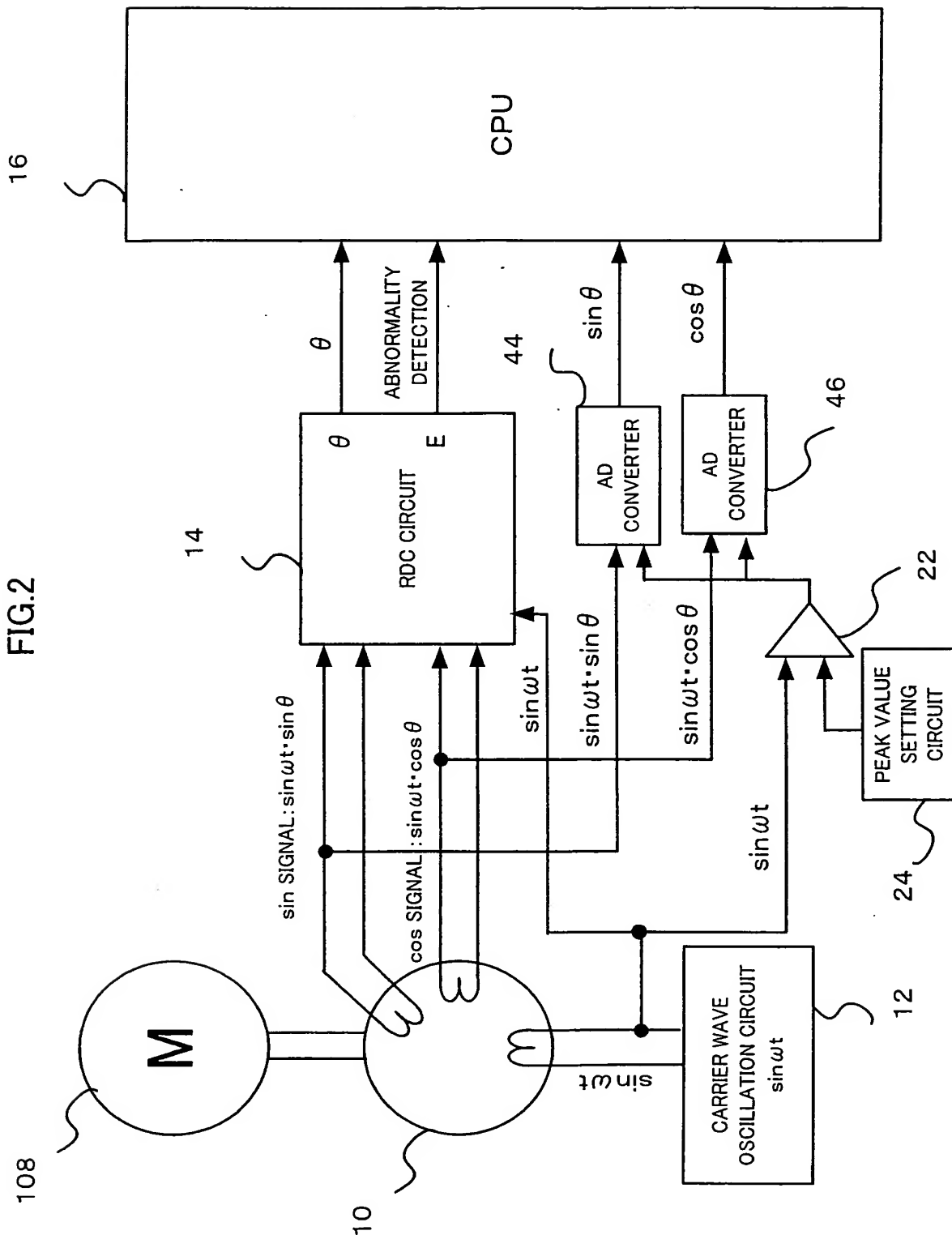


FIG.3

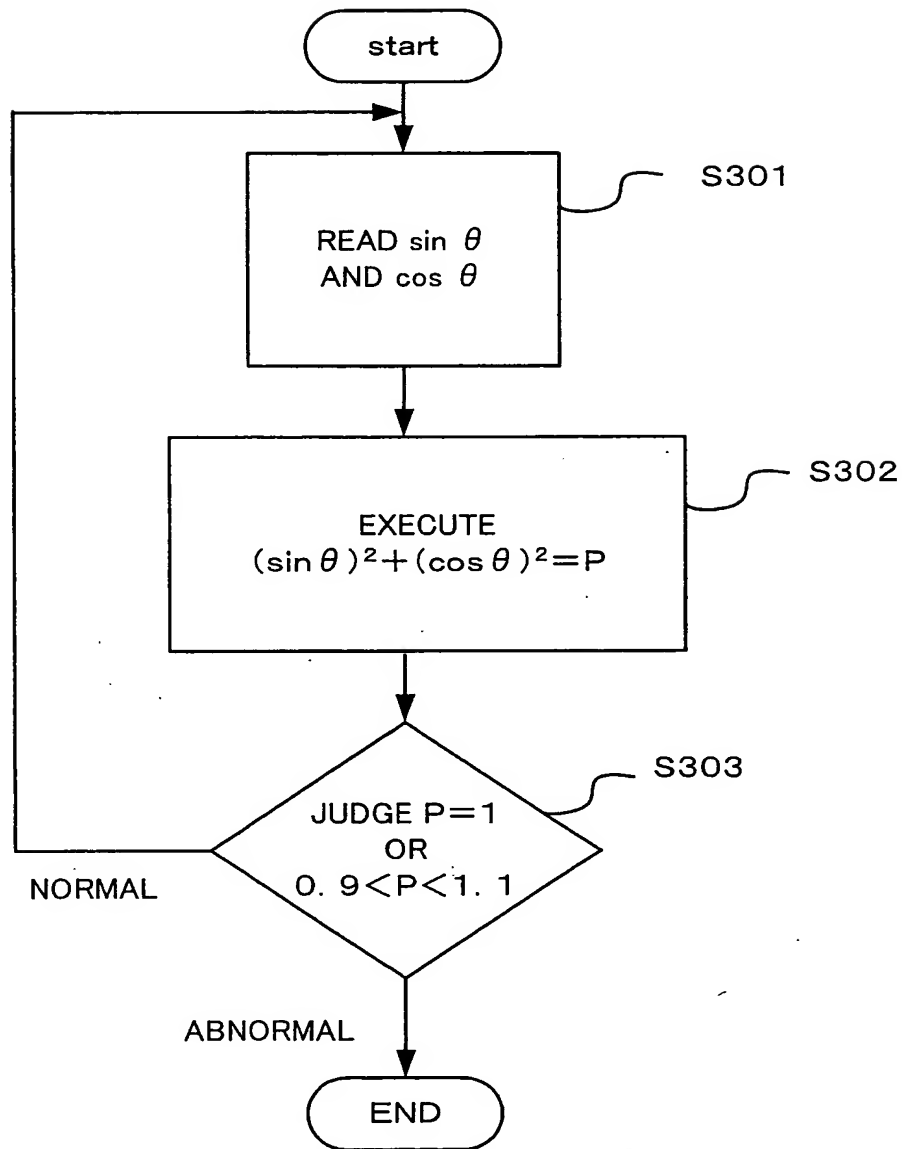


FIG.4

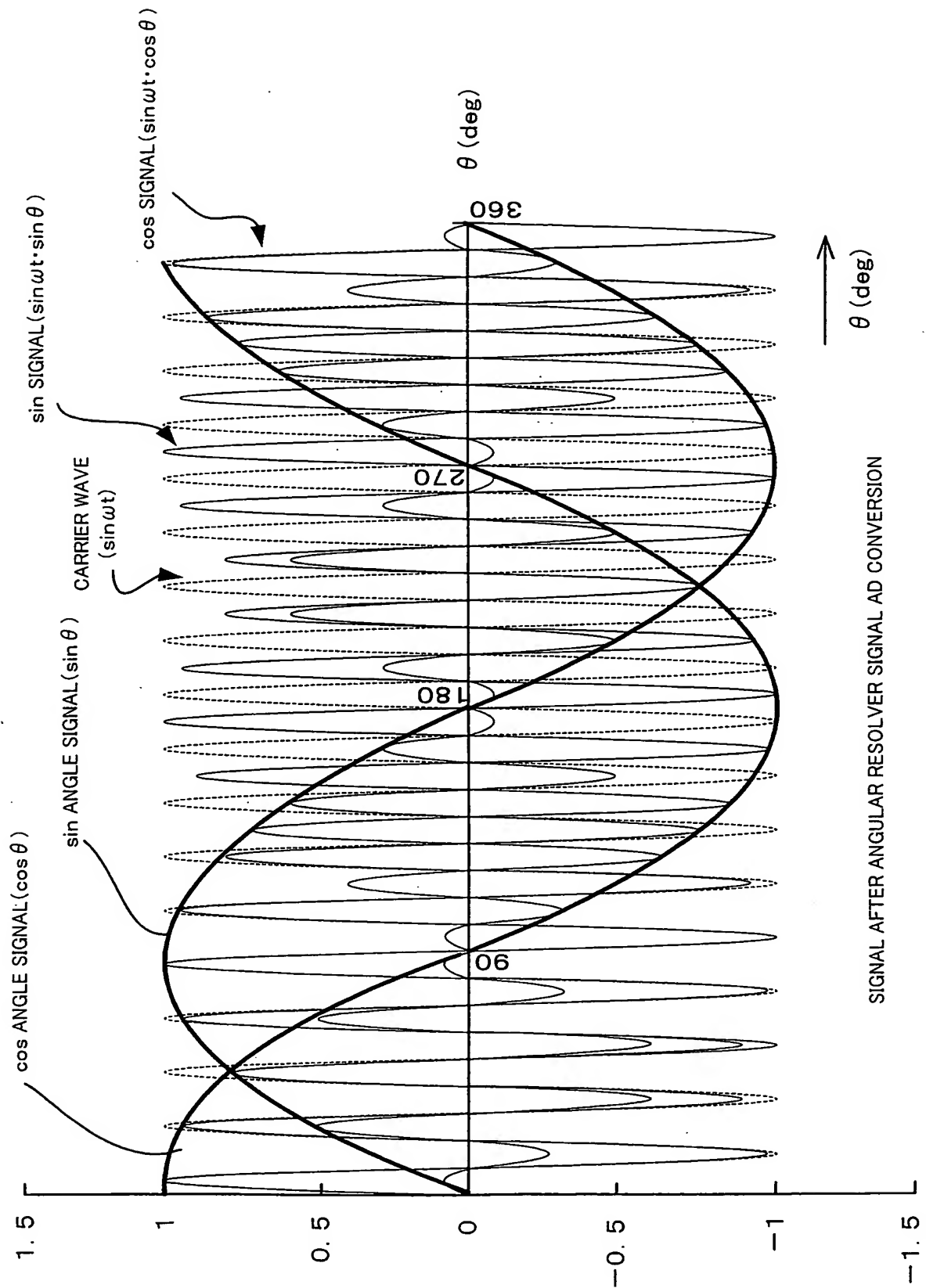


FIG.5

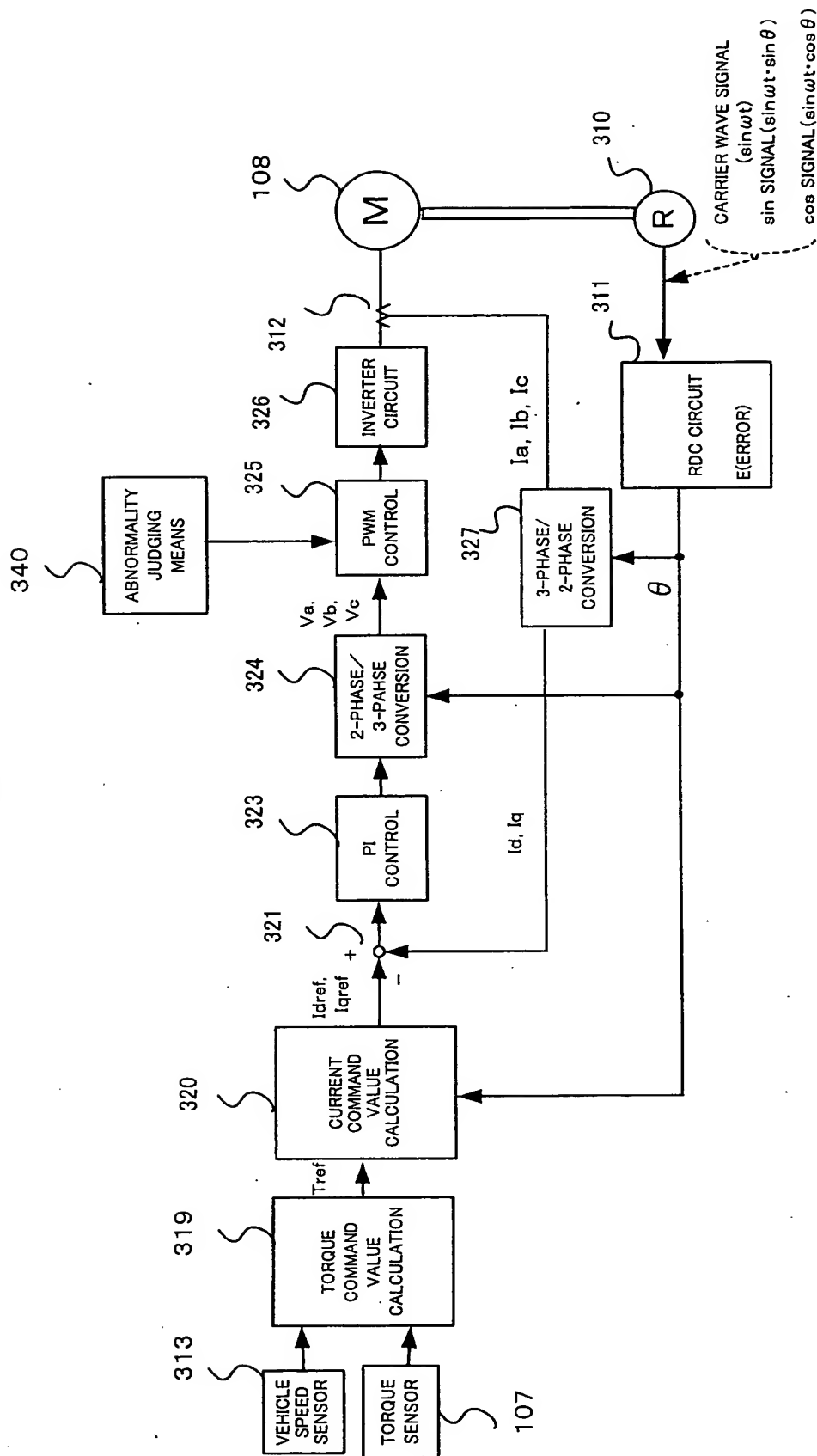


FIG.6

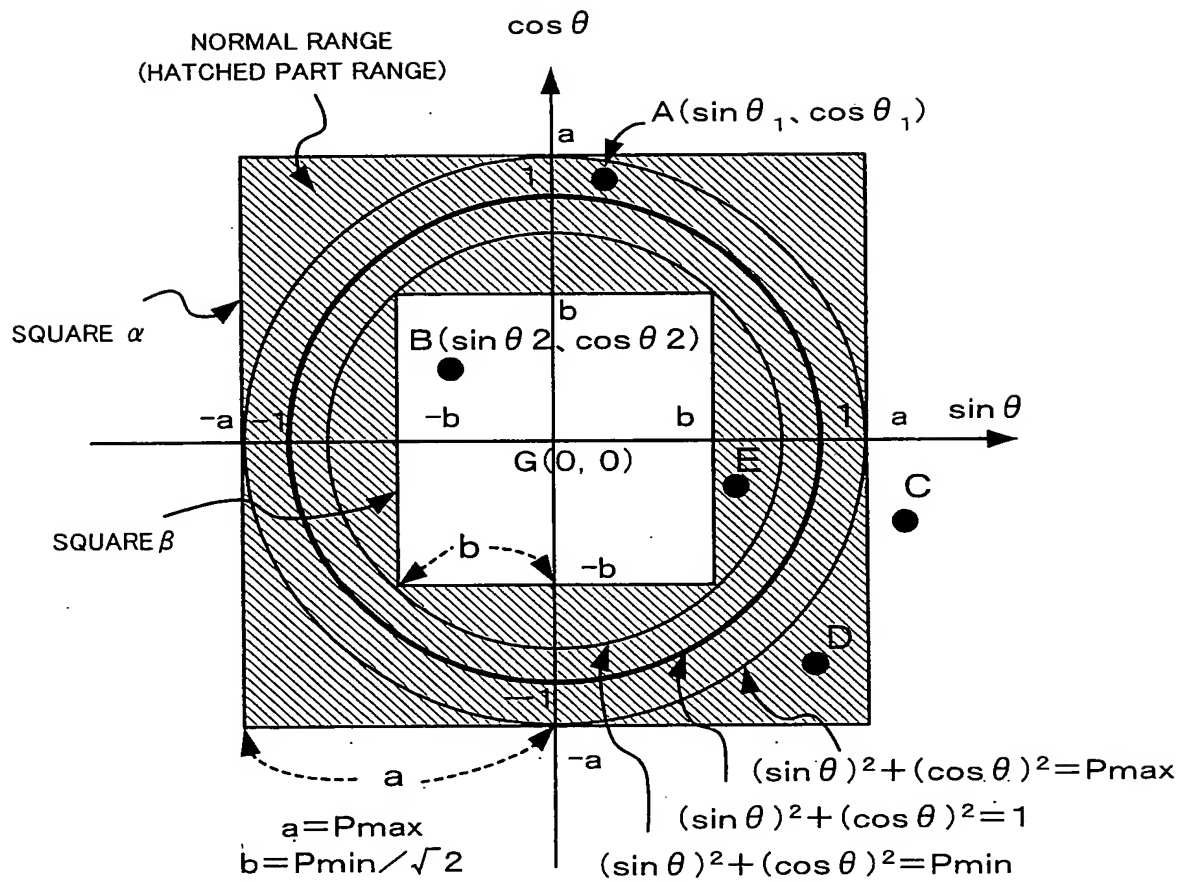


FIG.7

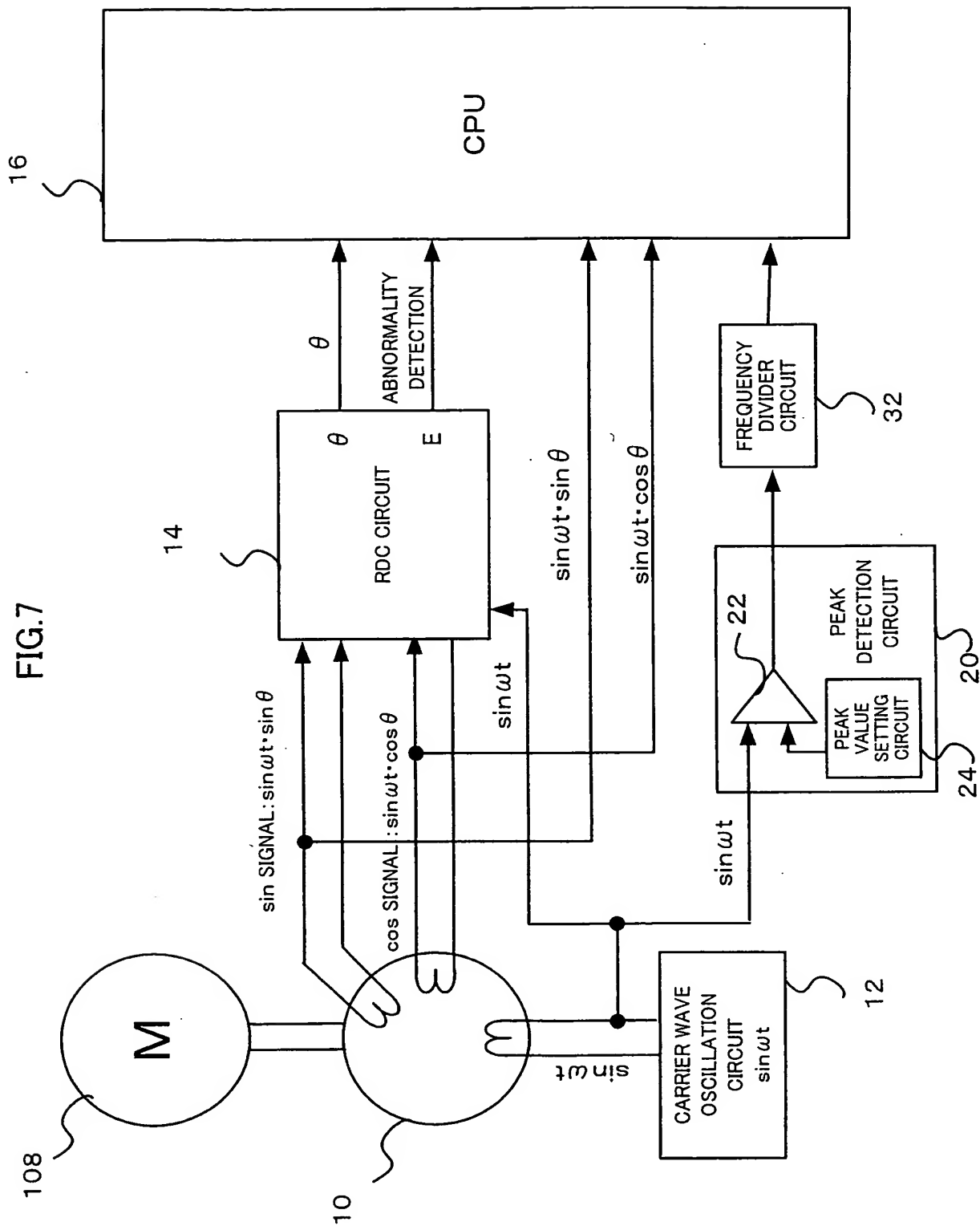


FIG.8

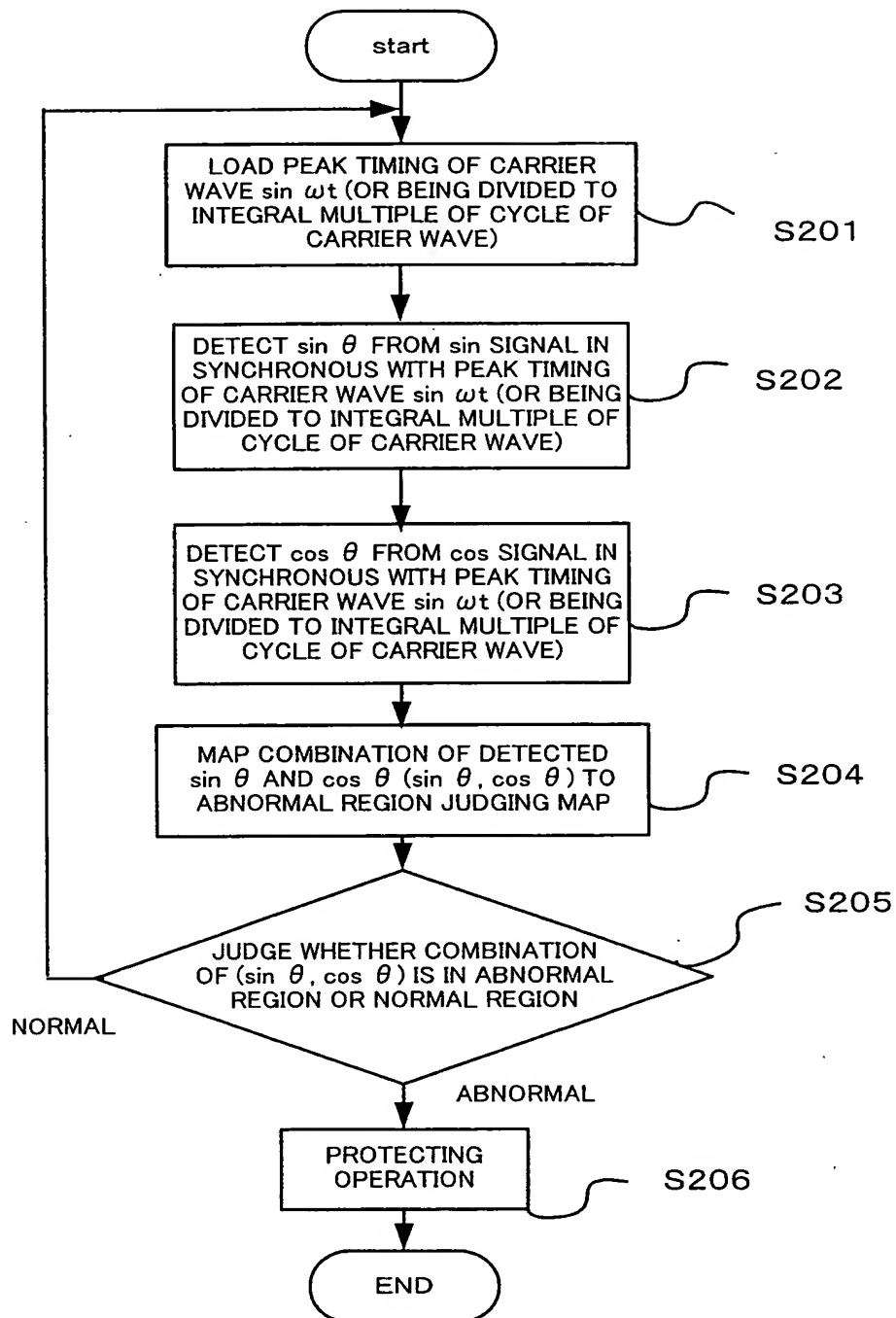


FIG.9

$\frac{\sin \theta}{\cos \theta}$	NO MORE THAN - a	-a~-b	-a~a		a~b	NO LESS THAN b
NO MORE THAN - a	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL
-a~-b	ABNORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ABNORMAL
-a~a	ABNORMAL	NORMAL	ABNORMAL	ABNORMAL	NORMAL	ABNORMAL
	ABNORMAL	NORMAL	ABNORMAL	ABNORMAL	NORMAL	ABNORMAL
a~b	ABNORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ABNORMAL
NO LESS THAN b	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL

FIG.10

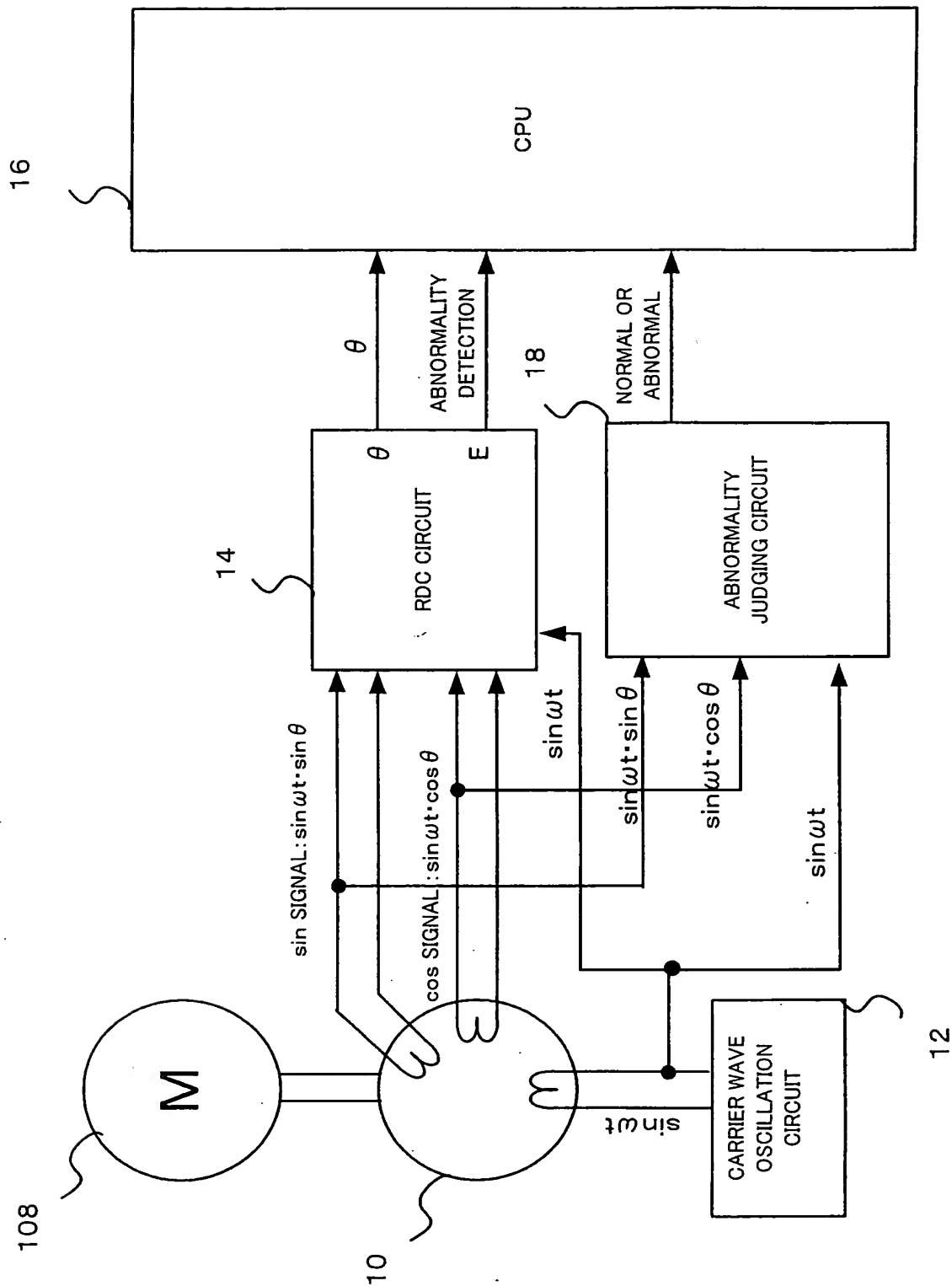


FIG.11

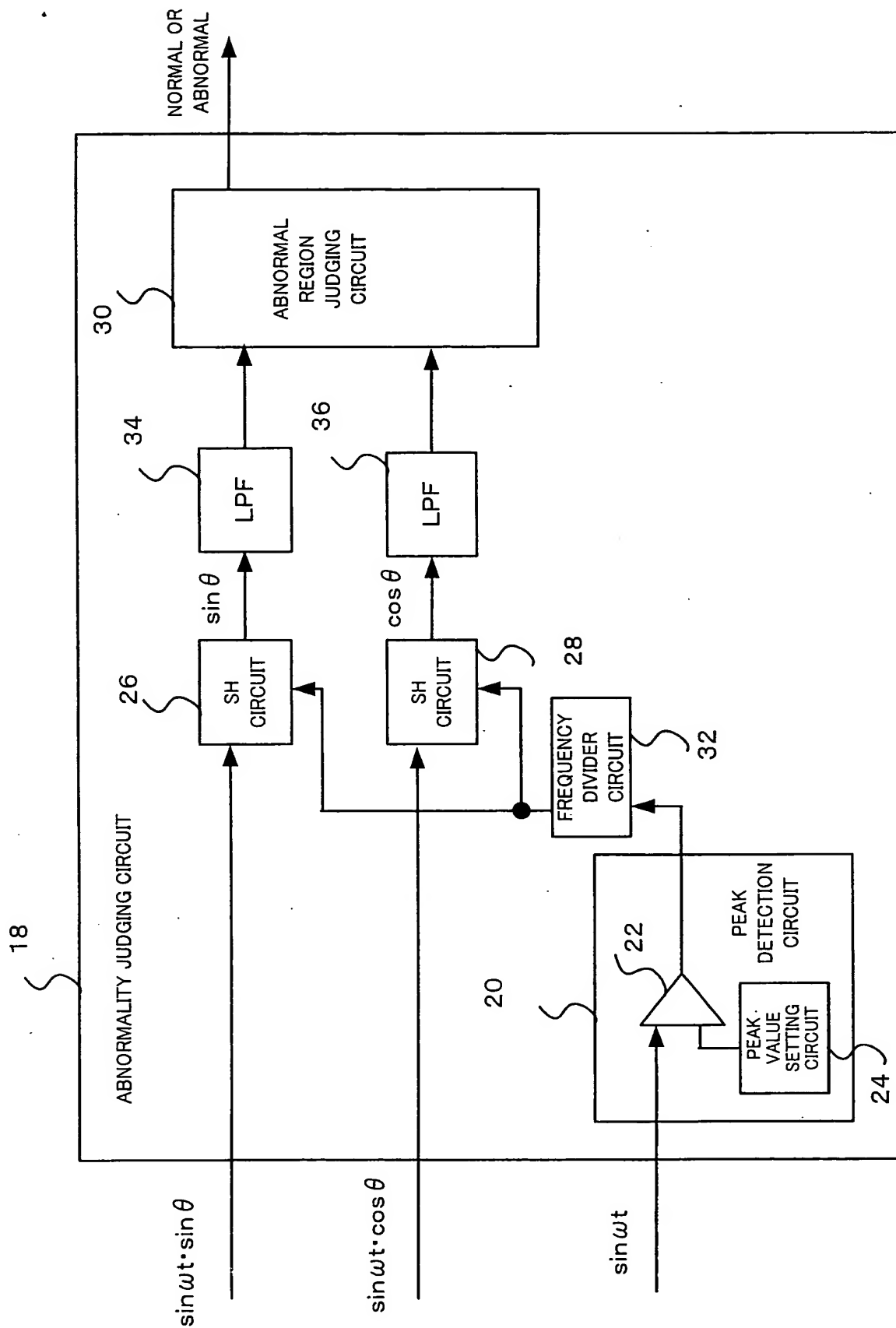


FIG.12

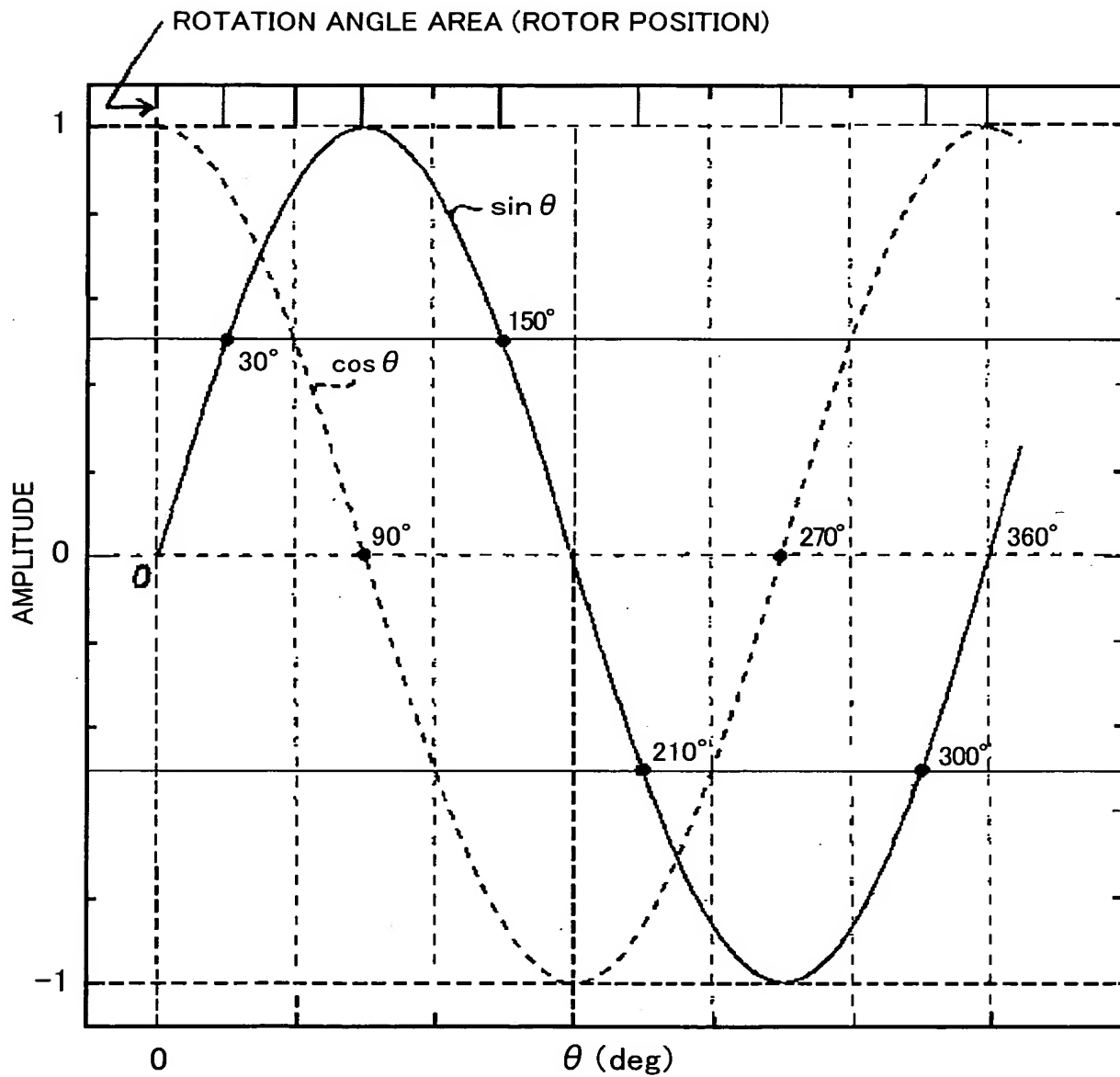


FIG.13

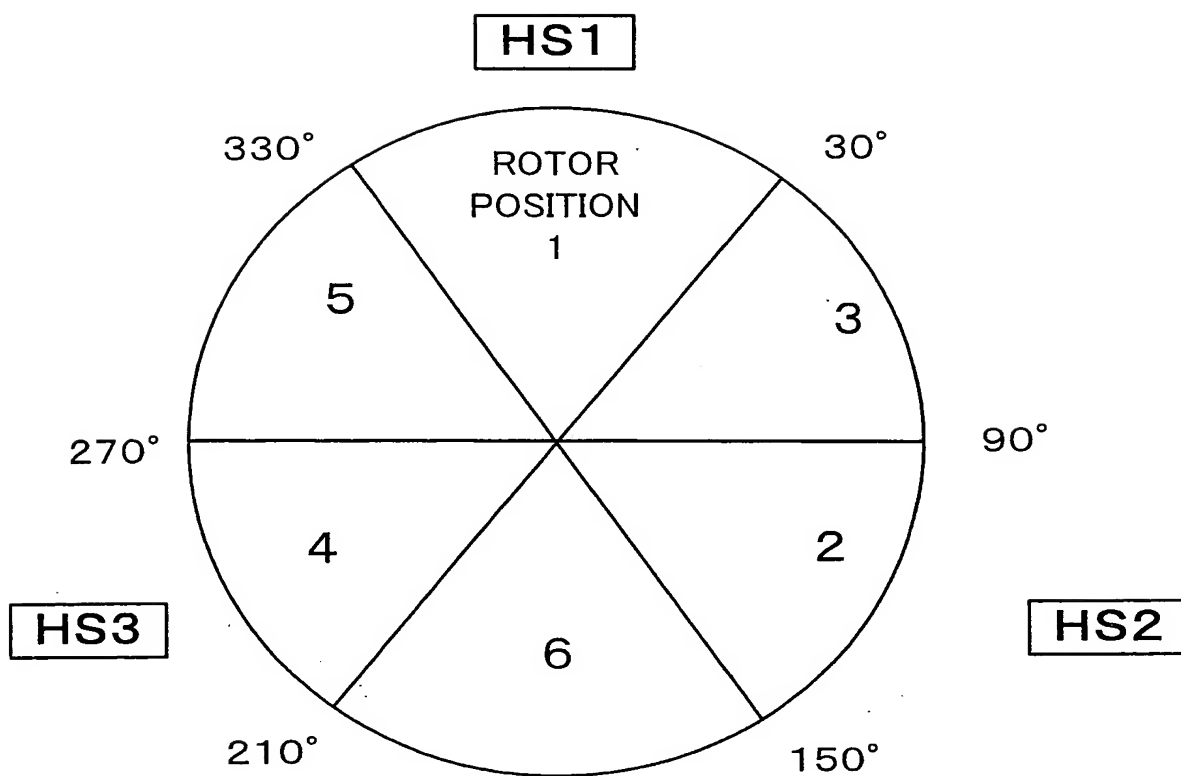


FIG. 14

The diagram illustrates a motor control system with two main control paths: **VECTOR CONTROL** (left) and **RECTANGULAR WAVE CONTROL** (right).

VECTOR CONTROL (Left Path):

- 313** VEHICLE SPEED SENSOR and **107** TORQUE SENSOR provide input to **319** TORQUE COMMAND VALUE CALCULATION.
- 319** outputs **Tref** to **452-1**.
- 452-1** feeds into **456-1** (3-PHASE/2-PHASE CONVERSION).
- 456-1** outputs **Id, Iq** to **453-1** (CURRENT COMMAND VALUE CALCULATION).
- 453-1** outputs **Idref, Iqref** to a summing junction (+).
- 452-2** (CURRENT COMMAND VALUE CALCULATION) also feeds into the summing junction (+).
- The summing junction outputs **Vdref, Vqref** to **454-1** (PI CONTROL).
- 454-1** outputs **Vdref, Vqref, Vcref** to **455-1** (2-PHASE/3-PHASE CONVERSION).
- 455-1** outputs **Varef, Vbref, Vcref** to **451** (SUMMING JUNCTION).

RECTANGULAR WAVE CONTROL (Right Path):

- 50** 3bit SIGNAL (CORRESPONDING TO HALL SENSOR SIGNAL) feeds into **452-2** and **454-2** (PI CONTROL).
- 452-2** outputs **Iaref, Ibref, Icref** to a summing junction (+).
- 454-2** (PI CONTROL) also feeds into the summing junction (+).
- The summing junction outputs **Varef, Vbref, Vcref** to **451**.

Common Components and Signals:

- 451** (SUMMING JUNCTION) receives **Varef, Vbref, Vcref** from both paths and outputs **E** (ERROR) to **311** RDC CIRCUIT (MAIN ANGLE PROCESSING CIRCUIT).
- 311** outputs **θ** to **456-1** and **455-1**.
- E** is also fed back to **453-1** and **452-2**.
- 325** PWM CONTROL receives **E** and **θ** to generate **Ia, Ib, Ic**.
- 326** INVERTER CIRCUIT receives **Ia, Ib, Ic** to drive the motor.
- The motor consists of **108** (MOTOR) and **310** (RESISTOR **R**).
- 312** is a feedback point from the motor output.

Legend:

- CARRIER WAVE SIGNAL** ($\sin \omega t$)
- sin SIGNAL** ($\sin \omega t \cdot \sin \theta$)
- cos SIGNAL** ($\sin \omega t \cdot \cos \theta$)

FIG. 15

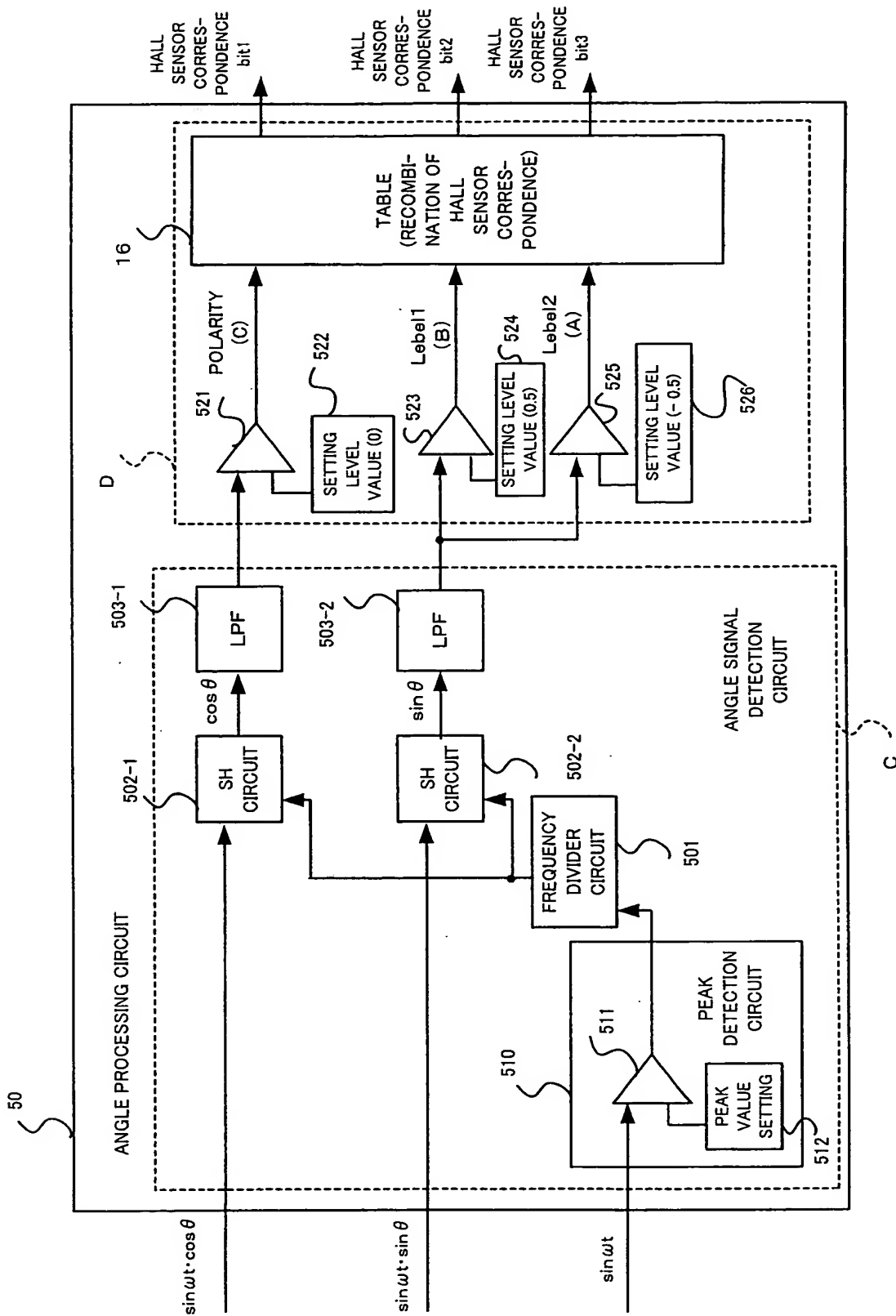


FIG.16

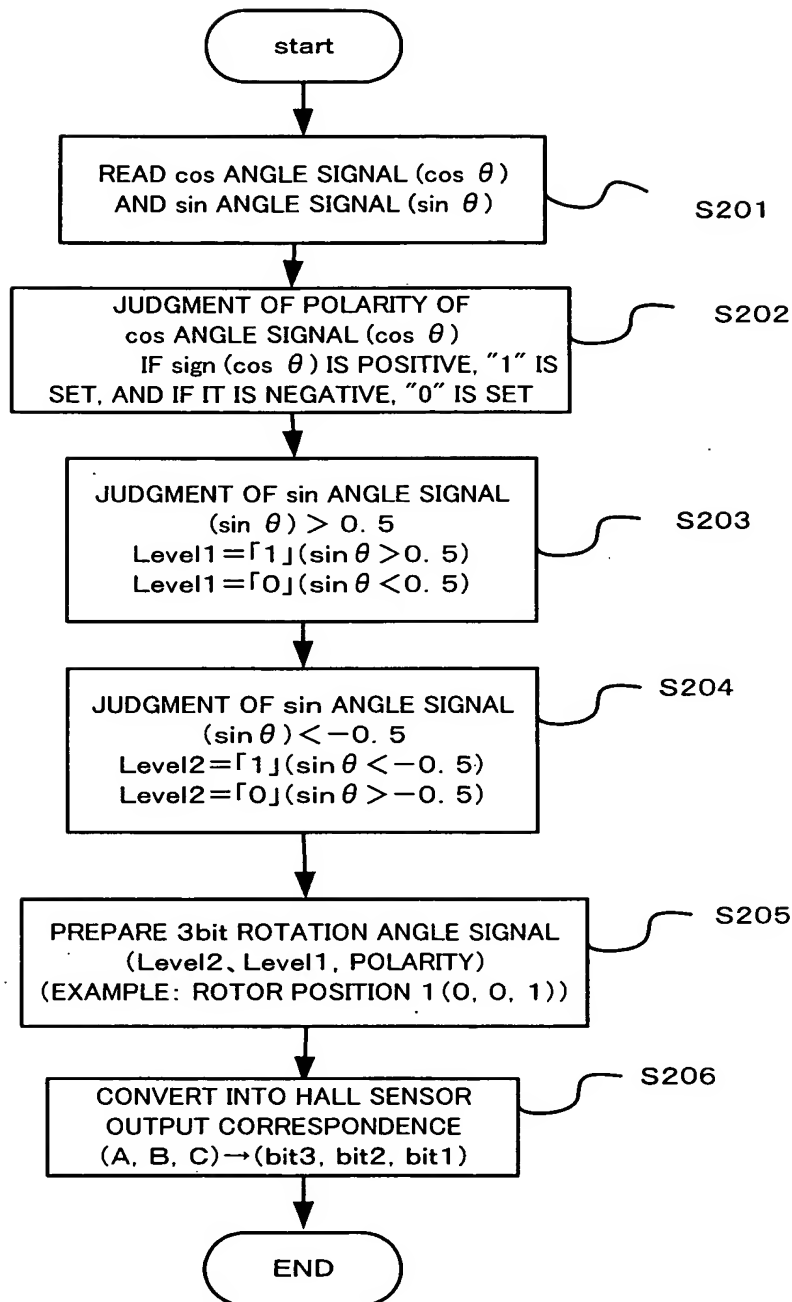


FIG.17

